



# RIGID VINYL

## for Building Products

SIDING • WINDOWS • GUTTERS • SHUTTERS •  
BASEBOARD RACEWAYS • PIPE • THRESHOLD •  
ELECTRICAL CONDUIT • ROOF EDGING • LOUVERS  
SKYLIGHT EDGING • FASCIA...AND MANY MORE

- *Quality*
- *Self-extinguishing*
- *Non-conductive*  
*Heat*  
*Electricity*
- *Toughness*
- *Color, Beauty*
- *Corrosion Resistant*
- *Long Life*
- *Minimum Maintenance*
- *Light Weight*
- *Chemical Resistant*

# Geon<sup>®</sup> VINYLs...

the **material difference** in building



## What they are...

Geon vinyls were created by B. F. Goodrich Chemical Company to meet a multitude of needs in many industries. This booklet will discuss only rigid Geon vinyls for use in the manufacture of problem-solving building products. The properties of rigid vinyl compounds can be widely varied to meet the design requirements of a multitude of interior and exterior applications. Rigid Geon vinyls have become pacemakers in building products by solving old problems for the industry. The following are reasons why:

### SELF-EXTINGUISHING



By its natural molecular structure rigid Geon vinyl does not support combustion. That is, rigid vinyl will decompose when held in flame, but when flame is removed, the burning stops — a highly important difference in building materials. It is rated as self-extinguishing by standard American Society for Testing Materials tests (D635). In the U/L tunnel test (ASTM Test No. E-84-50T), a flame spread rating for a typical rigid vinyl building compound is 15-25.

### WEATHERING, AGING

Rigid vinyls compounded for outdoor applications stand up to the elements. Siding samples exposed for as long as seven years have performed satisfactorily without need for painting or repair.

Because color goes clear through vinyl material there are no coatings to peel or bubble. Extensive outdoor testing in varied climates is a continuing program. Compounds are selected on the basis of end use to insure optimum retention of properties and beauty.

### CORROSION

Rigid Geon vinyls will not rust, pit or corrode. Not affected by common household solvents and many industrial chemicals. Thus, beauty is retained.

### THERMAL TRANSMISSION

Rigid vinyl is warm to the touch. Thermal conductivity is 1.3 Btu/ft.<sup>2</sup>/hr./°F/in. Moisture condensation is minimized. Window frames and siding of Geon vinyl are excellent insulators.

### ELECTRICALLY NON-CONDUCTIVE

Vinyls are immune to galvanic corrosion and are excellent electrical insulators. This is obvious because of vinyl's long success as wire and cable insulation. Thus, it offers protection from another hazard — accidental shock from worn or broken wires rubbing against metal building products.

### IMPACT STRENGTH

Practical advantages of the good impact resistance of vinyl show up in resistance of vinyl siding to denting and in the resilience of gutters. See examples under Durability.

## BUILDING PRODUCT



BFG Chemical Company's identification program is designed to build confidence in building products made of rigid Geon vinyl (Geon PVC).

The identification is the emblem on left. This symbol is available to qualified manufacturers using rigid Geon PVC in selected building products, excluding pipe and conduit.

To use the identification, building product manufacturers must provide documentary evidence and assurances to BFG Chemical Company's satisfaction that they are meeting these requirements:





## INSTALLATION

Like most plastics, rigid Geon vinyls are light, therefore, easier to handle, allowing quicker and lower cost installation. Example: A large Florida housing project had an estimated installation cost savings of \$28,000 by using lightweight, easily installed rigid vinyl (PVC) drain lines instead of cast iron pipe.

## ABRASION RESISTANCE

The unqualified success of vinyl floor tile exemplifies the excellent scuff and scrape resistance of vinyls.

## Physical Properties—Rigid Geon Vinyls

Compound No.	8750	8759	82662	8700A	ASTM Test
Tensile strength (psi)					
-40°F	12,000	11,200	—	12,000	D 638
32°F	9,000	9,100	—	7,600	
73.4°F	7,300	7,500	—	6,200	
140°F	3,600	4,500	—	3,400	
Compressive strength (psi)	9,600	9,400	9,500	8,600	D 695
Elongation @ yield (%)	3	3	—	3	D 638
Flexural strength (psi)	14,500	15,000	16,000	11,500	D 790
Modulus of elasticity at 73.4° (psi)	410,000	410,000	400,000	320,000	D 638
Izod impact strength (ft lb/in notch)					
-40°F	.35	.69	—	.49	
32°F	.47	—	—	1.47	
73.4°F	.81	1.5	1.5	15.0	
140°F	1.26	11.0	—	18.4	
Thermal conductivity, BTU/ft <sup>2</sup> /hr (°F/in)	1.2	1.3	1.3	1.5	C 177
Coefficient of linear expansion (per °C)	5.2	6.7	6.7	10	D 696
Hardness (Durometer D)	80	80	80	78	D 676
Specific gravity	1.38	1.38	1.38	1.35	D 792
Flammability	self-ext.	self-ext.	self-ext.	self-ext.	D 635
Heat distortion (°F at 264 psi)	157	160	157	155	D 648

## LIMITATIONS

No, the miracle material is not here yet. Though rigid Geon vinyls are superior in a combination of properties to many traditional building materials, it has limitations that should be kept in mind when specifying products made from rigid vinyl.

The load bearing capacity and modulus of elasticity of rigid vinyl is much lower than that of metals and wood, but its tensile strength is superior to other thermoplastics. The load bearing properties of a finished product of rigid vinyl should be checked carefully before use in this capacity. The coefficient of thermal expansion of rigid vinyl is approximately two times

## DURABILITY

Rigid Geon vinyls are just plain tough. Their outstanding combination of properties keeps end products in service year after year with little or no maintenance — a big difference in a material for building. U.S. Navy Bureau of Ships chose PVC pipe of Geon vinyl in a topside spray washdown system as a safeguard against nuclear fallout. The system, which can spray a ship with thousands of gallons of seawater in minutes, has performed satisfactorily since 1953.

that of aluminum. The range is 2.9 to 5.5 x 10<sup>-5</sup> per °F, (ASTM D696). Quality products of rigid vinyl have, in general, overcome this characteristic by proper design.

While the chemical resistance of rigid vinyl is excellent, it is susceptible to attack by aromatic solvents used in certain industries.

Though there are limitations, the success of rigid vinyl as a pipe material proves its potential and capabilities. Producers of building products have confidence in rigid Geon vinyl and this confidence is being translated into finished products of quality that can be specified and used with assurance.

# IDENTIFICATION PROGRAM

1. The building product must be fabricated from rigid Geon vinyl compounds approved for the specific application by BFG Chemical.
2. The product must be manufactured under an adequate and continuing quality control program.
3. There must be appropriate quality standards and specifications covering any intermediate suppliers.
4. The manufacturer must assure the workmanship and reliability of the product, and
5. The manufacturer must provide proof of the product's performance in actual use for an appropriate length of time.

Upon fulfilling these requirements, the participant enters into a signed agreement with BFG Chemical. The agreement necessitates submission of documented evidence that the requirements are fulfilled and covers the obligations and responsibilities of both companies.

Any agreement is confined to the use of specific rigid Geon vinyl compounds in specific products. BFG Chemical reserves the right to end participation with any manufacturer who fails to live up to the terms of the agreement.

The following companies have already joined us in our quality rigid vinyl building products program:

**Windows:** Andersen Corporation, Bayport, Minnesota, Caradco, Inc., Dubuque, Iowa.

**The Malta Manufacturing Company,** Gahanna, Ohio,

**Siding, roof edging:** Bird & Son, Inc., East Walpole, Mass.

**Siding:** The United States Gypsum Company, Chicago, Illinois.



## SIDING

- No Painting Required
- Effective Insulation . . . Lower Heating and Cooling Cost
- No Dents or Splinters

Rigid vinyl siding for homes means enhanced sales appeal. Rigid vinyl siding is not a coating or veneer, but is solid sheet backed with insulating board. Color goes clear through the vinyl sheet, thus scratches are less noticeable. Vinyl siding will not rot, peel, blister, rust, corrode or be eaten by termites. Another excellent selling point—siding of rigid vinyl is virtually maintenance free. It can be painted with commercially available paint if color change is desired. It does not conduct electricity, interfere with radio or television reception. It is rated non-flammable by the UL tunnel test.

Vinyl is a natural thermal insulator. Keeps out the sun's heat, humidity and winter's cold. Heating and cooling bills will be less. It helps to keep noise levels down, too.

Baseballs and hailstones bounce off without leaving dents or splinters. Unsightly depressions and nicks are thus eliminated. Commercially available.

Photo courtesy Bird & Son, Inc.,  
East Walpole, Mass.



## GEON VINYL...THE

## PRIME WINDOWS

- No Pitting, Rotting, Warping
- Exceptional Weather Tightness
- No Condensation or Sweating

Rigid Geon vinyl used by itself or in conjunction with other materials in window components offers answers to old window problems. Smooth satin-surfaced jamb liners eliminate sticking and provide finger-tip lift. And they continue to operate that way because of vinyl's resistance to abrasion.

Sash of rigid Geon vinyl is a natural insulator minimizing heat loss and eliminating condensation and sweating. Homeowners' fuel bills go down and comfort goes up. The vinyl components can be manufactured to very close tolerances — a necessity for obtaining exceptional weathertightness. Rigid Geon vinyl has helped manufacturers of windows to achieve weathertightness two to four times that required by industry standards. The more vinyl used, the less maintenance there is. No painstaking, time-consuming painting needed. No pitting, rotting or warping to harass the homeowner. Commercially available.



Photo courtesy Andersen Corp.,  
Bayport, Minnesota





Photo courtesy The United States Gypsum Co.,  
Chicago, Ill.



## MATERIAL DIFFERENCE IN BUILDING

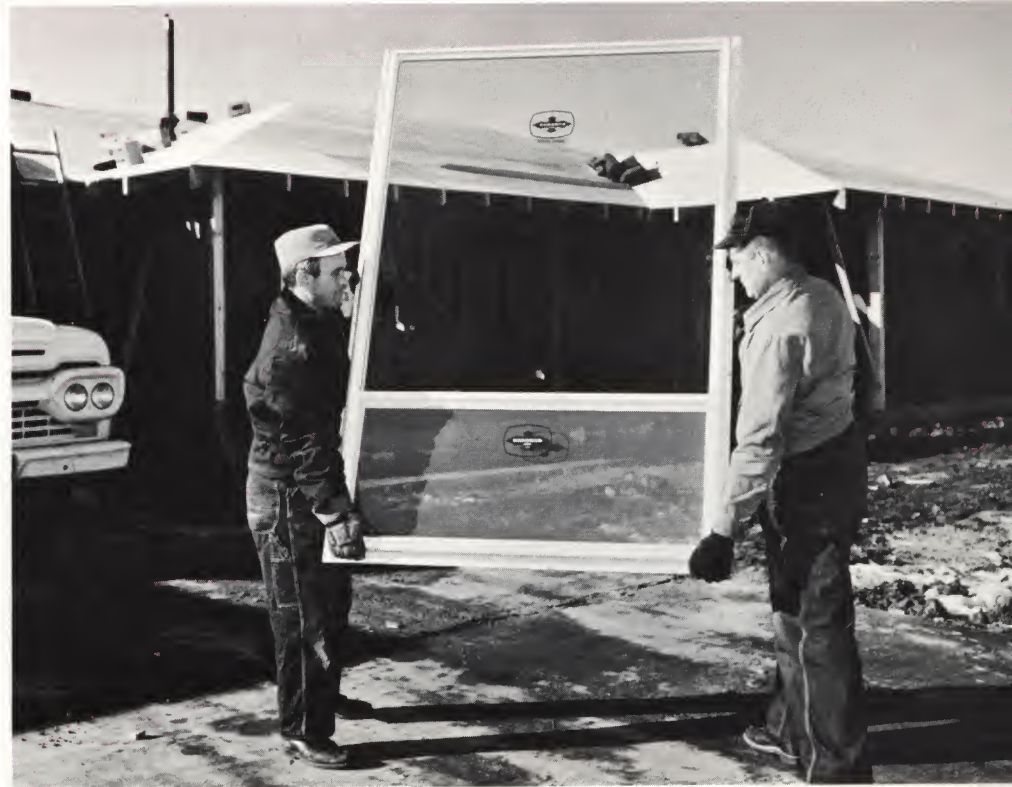


Photo courtesy Caradco, Inc.,  
Dubuque, Iowa



## GUTTERS

- No Rust or Corrosion
- Light Weight but Tough

Hot roofs and winter ice are rugged — but conquerable foes for gutters and downspouts of rigid Geon vinyl. Years of development have paved the way for introduction of this new application of rigid vinyl. Vinyl gutters have been used successfully for years in Europe.

The gutters need no paint. They do not rust or corrode and are light in weight. In one unscientific but realistic test an eight foot gutter section was frozen solid. At 20° F. the ice was smashed with a 2 x 4. There was no damage to the rigid vinyl gutter. Semi-commercial.



A blow strong enough to shatter four inches of solid ice bounces harmlessly off this rigid vinyl gutter



Photo courtesy Johnson Plastic Corp., Chagrin Falls, Ohio

## BASEBOARD RACEWAY

- All Wiring in one Unit

Rigid vinyl offers beauty, color and protection for home and building wiring in one unit. Easily installed and maintained, vinyl raceway offers quick access to wires for replacements and additions. Commercially available.

## SHUTTERS

- Maintenance Free
- Lower Cost than Wood

The charm and beauty of shutters are enhanced if they are maintenance-free. Decorative shutters of rigid Geon vinyl never rot nor need paint. There is no fear of splitting or warping. Appearance of wooden shutters can be accurately duplicated. Colors are available. Cost of the vinyl shutters are lower than unpainted wooden shutters. Semi-commercial.





## PIPE

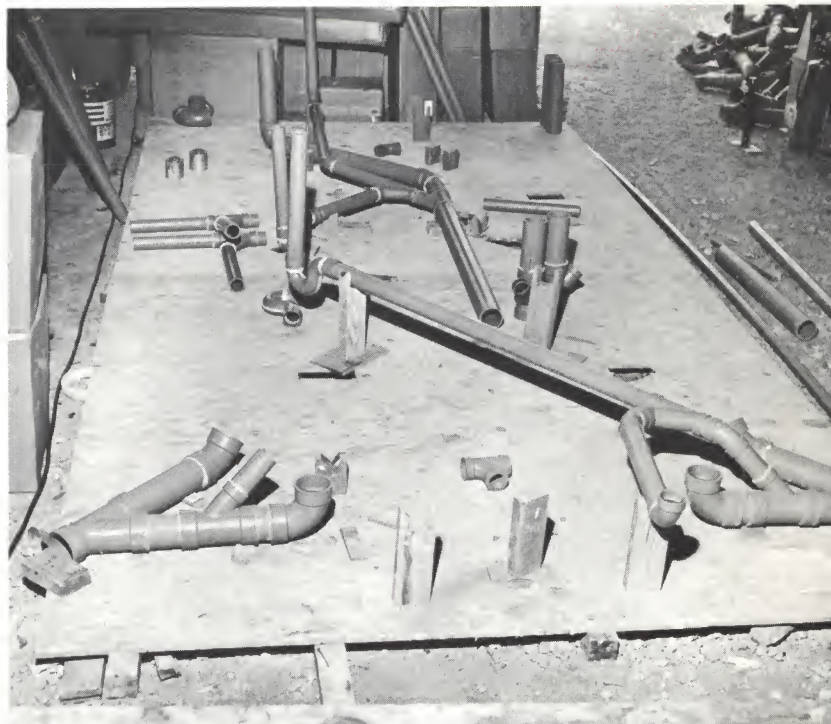
- Rigidity, Toughness
- Impact Strength
- Chemical and Corrosion Resistance

The "old pro" of rigid vinyl applications, rigid PVC pipe of Geon vinyl has been performing satisfactorily since a first major U.S. commercial use in 1952 — and longer in Europe. Today millions of feet of PVC pipe are installed annually.

PVC pipe first found acceptance through its outstanding combination of properties — rigidity, toughness, impact strength, chemical and corrosion resistance, weather resistance, no electrolytic corrosion, smooth interior and exterior surfaces, light weight, and ease of installation.

Pipe of Geon vinyl has handled practically every liquid from potable water to sour crude oil and ultra-pure chemicals for cosmetic and pharmaceutical products.

This long and varied service has earned PVC pipe acceptance by such organizations as the National Sanitation Foundation (potable water), Board of Building Standards of the Northeastern Ohio Building Officials (drain, waste and vent piping in one and two family dwellings), Building Officials Conference of America, Illinois State Plumbing Code (PVC pipe for drain and vent above ground in building walls) and many others. See also U.S. Department of Commerce Commercial Standards CS 256-63, TS 5608 and CS 207-60 (covers PVC pipe standards). Commercially available.



Preassembled drain systems of PVC pipe are light weight, easily installed

## ELECTRICAL CONDUIT

- Does Not Conduct Electricity
- Does Not Support Combustion

Conduit of rigid Geon vinyl is listed under the label service of Underwriters' Laboratories for above- and below-ground use. PVC conduit above-ground is covered by Article 347 of the National Electrical Code. PVC fittings are covered by Article 370. Below-ground and concrete-encased PVC conduit provides protection required by the National Electrical Code.

In addition to the properties listed above for PVC pipe, conduit of rigid Geon vinyl has other distinctive advantages. It does not conduct electricity — a special safety factor. PVC conduit does not support combustion, it is easily and quickly solvent welded in permanent leakproof joints and its smooth interior surface provides easy wire pulling, thus speeding installation further. Commercially available.



Corrosion-resistant conduit of rigid Geon vinyl offers easy pull-through, non-conductivity





## Other Rigid Vinyl Building Products



### ROOF EDGING

Long life and strength of rigid vinyl roof edgings offer neatness, continued beauty and no maintenance to roof installations. Commercially available.

### THRESHOLD

Wear resistant thresholds of rigid Geon vinyl require no painting. Color is clear through. Combined with flexible vinyl such thresholds are exceptionally weathertight. Commercially available.

### LOUVERS

Weather and corrosion resistant louvers of rigid vinyl are a permanent, easily cleaned accessory for homes and buildings. Lightweight louvers are easily installed. Commercially available.

### SKYLIGHT EDGING

Permanent non-rotting and non-rusting skylight edgings of rigid Geon vinyl are neat, trim and need no maintenance. Commercially available.

### AWNINGS

Weather resistant awnings of rigid Geon vinyls retain their beauty and color. They stand up to winter's worst and summer's hottest. And they're quiet. Commercially available.



### FASCIA

Building fascia formed from sheet of rigid Geon vinyl offers a neat, durable, colorful trim. The first major installation is now performing well in its tenth year. Semi-commercial.

### MANY MORE

The acceptance of rigid Geon vinyl for building materials is accelerating. There are other products now and more coming which space does not permit listing. We will keep you informed.



## Specialized Literature

For more information about the rigid vinyl products of particular interest to you, ask for the bulletins listed below:

**PVC Pipe—G-24:** Host of PVC pipe applications, data on various uses, 24 pages.

**PVC Conduit—G-28:** PVC conduit application, data, installation information, 16 pages.

**PVC pipe for Potable Water, G-29:** Number of large uses of PVC pipe for potable water, 16 pages.

**PVC for DWV, G-31:** Applications and histories of PVC pipe in drain, waste, vent systems, 16 pages.

**Designing with Rigid Vinyl, G-30:** Property and design data for new and old rigid PVC products, 24 pages.

**Rigid Sheet Technology, G-17:** Property, design and fabrication information concerning rigid vinyl sheet, 24 pages.

**New Building Products of Geon Vinyls:** Periodical. Discusses new building materials made from Geon vinyl. Ask to be put on mailing list. Write for special issue discussing identification program.

Should you need help in the use of products made from Geon vinyl, our technical representatives or our customers can be of service. Your inquiry is welcome. We believe that the information in this bulletin is accurate. Results cannot be guaranteed for processes not under our direct control.

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**B. F. Goodrich Chemical Company**

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Litho in U.S.A.





## Other Rigid Vinyl Building Products



### THRESHOLD

Wear resistant thresholds of rigid Geon vinyl require no painting. Color is clear through. Combined with flexible vinyl such thresholds are



### ROOF ED

Long life and strength offer neatness, convenience to roof installation.

### MANY MORE

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